Supervising Multidisciplinary Research: Navigating Challenges and Reaping Rewards

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Abstract: International research is already booming, and global problems like climate change have sparked interdisciplinary initiatives involving academics from many nations, disciplines, and tongues. Integrating the research team, the supervisors, and the doctoral students present several challenges, such as multicultural issues; integrating a good team depends on the supervision style and type of postgraduate students and how to supervise students to conduct quality research. This article examines supervisory approaches, and the challenges and rewards supervisors face while supervising diverse projects. The lectures from the Graduate Studies in Supervision course were examined, along with a literature study. Two senior supervisors from the International Business School (JIBS) and the School of Engineering at Jönköping University participated in small-scale research and observed two supervisory sessions, where were discussions and supervisor reflections. Observations, talks, and the findings of a survey based on Lee's research were compared to determine the supervisory style. The failure to define the scope and writing of the publication when a journal article is rejected after 1-2 years, which affects the trust of the student and the supervisor and the time plan in a multidisciplinary project, are just a few of the challenges that emerged during postgraduate supervision. Discovering our teaching and supervision style may help guide our students in a multidisciplinary environment.

Keywords: Supervision, challenges, rewards, multidisciplinary, engineering sciences.

Introduction

Complex emergencies like the impact of climate change have pushed the world to search for a clean energy

transformation, investigating and creating new technologies that could contribute with it, however, the relation between the Research in Academy, Industrial Sector and Government are essential to advance with the development of these new technologies. (Dawood, Yusuf, & Muammer, 2021), (Kaneberg, Rico, Hertz, & al., 2022).

In Academy, these complex emergencies have changed the way of research adapting to the changing nature of intellectual and social challenges: the increasing role of interdisciplinary, the expansion of research in society, the emergence of "knowledge" society, from individual research projects to participation/collaboration in research teams. The increasing role of external/international funding following or create new rules or guidelines including not only engineering topics, but multicultural ethics, and social rules as well (Roger Säljö, 2022). Thus, adequate supervision could provide tools like an interdisciplinary response to these complex problems, how to investigate, conceptualize and create new solutions to deal with ethical aspects and to encourage academic leadership, networking, and internationalization developments in multidisciplinary settings, (Lee, 2012).

However, how to know if we, as supervisors, could provide an adequate supervision? According to (Lee, 2018), the development of supervisors through courses, workshops, mentoring, and awards is a relatively new area of academic staff development. Questions about evaluating supervisor development activities as well as whether and how supervisors should be accredited have only just begun to be ask. Supervisors of the modern doctorate are still mostly drawn from academia, co-supervisors drawn from industry, professional and creative practice need further study, (Lee, 2018).

In order to understand how to be an adequate supervisor, the purpose of this article is identifying the supervision and the doctoral students' styles and explore the challenges and rewards that supervisors have during their process of supervision in multidisciplinary projects. To conduct this article, a literature is reviewed, then a small study through observations and a survey is showed and finally the analysis of results observations, discussions and conclusions are presented.

Literature

The literature review is based on general literature and the Supervision Postgraduate Studies (SPS), code FLHDK32, course´s lectures.

Multidisciplinary

Multidisciplinary collaboration in higher education represents one of the major trends, impacting academic's supervision, (Lee, 2012), (Kessel, Rosenfield, & Anderson, 2003). Multidisciplinary project in higher education refers a collaboration between Industry and Educational institutions to address complex problems or challenges that require expertise from different disciplines where, practitioners, supervisors and students work together,

(Hero & Lindfors, 2019).

The process of carrying out a multidisciplinary project may vary, depending on the country, systems, government standards, foundations, etc... nowadays international research is more common and the members of the project must adapt according to the laws of the institutions and companies. However, the multidisciplinary approach remains a controversial issue, according to Gibney, with critics of this trend claiming that collaboration will kill off multidisciplinary approaches, while others point to its potential to substantially increase academic efficiency, (Gibney, Copeland, & Murie, 2009).

The Role of Supervisor

A central dimension in higher education is supervision which has become more important for universities to consider not least because of external demands to avoid inefficient research impacts and the requested academic accountability, (Kumar & Stracke, 2007). A supervisor is the one who supervises the investigation and manages the life projects; According to (Lee, 2012) a good supervisor is one who knows how to productively manage the inevitable tensions that arise between people, the research itself and the institutional objectives.

However, there are more skills that a supervisor must have, sometimes it must be a psychologist, a teacher, a friend, or a guide without crossing a fine line between a friend and a person with "authority". Acting professionally and personally, creating a research environment will have an impact on how students will conduct their research; allowing for creativity and originality is a crucial test of research supervision.

Aspects that lead independent researchers, such as building a genuine supervisor-student relationship, and structured supervision with clear and reflective objectives, they have shown tolerance for ambiguity, resilience, and practical intelligence that allow them to solve problems more independently (Lee, 2012) (Blomberg, 2022) (Larsson, 2022).

The objective of a research supervisor is to contribute to the development of the researcher and help him/her to be a doctor, who will need to demonstrate the ability to contribute to social development and support the learning of others both through research and education and in some other way, qualified professional capacity (Sandblom, 2022).

Supervision Style

Since the beginning of the 1900s, when educational programs started in social work in the United States, supervision began to be a formally developed pedagogic instrument. The initial strong influences on the tradition of supervision of European professionals in social work came from the European psychoanalytical tradition of the 1920s. Thus, supervisory methods were developed with strong psychoanalytic or psychodynamic theoretical bases. Regardless of theoretical basis or orientation, the aim of supervision is to increase the

knowledge and competence of the practitioner, whether you deal with human services professionals, students at the undergraduate level or PhD candidates (Emilsson & Johnsson, 2007).

The various forms of supervision are compartmentalized depending on what one focuses on. In problem-oriented supervision, one focuses on tasks that are undertaken together with the PhD student, comprising identified problems to be solved. In this situation the central objective is to teach the student how best to solve the problem and have the capacity to contribute to constructive solutions among supervised (Emilsson & Johnsson, 2007). During this process the communication, the environment and the relationship is a key to achieve the research goals.

However, through the supervision process many situations could happen, according to (Emilsson & Johnsson, 2007) many of the problems are attributed to the relationship between the supervisor and the PhD student. Problems like abuse of power by mentors, Apathetic supervision, Passive supervision, or an Ambiguous supervision, when the supervisor's comments the supervising input process are not clear and similar experiences have been reported in international studies (Amjad, Asaad, & Rico Cortez, 2020).

For the other hand, multidisciplinary supervision leads to scientific differences becoming a resource that can benefit the research communities. It not only creates learning and new opportunities for action in relation to everyday complex challenges. At the same time, it is an effective PhD student's development, which is based on the work with the core (Lee, 2008), (Amjad, Asaad, & Rico Cortez, 2020).

Positive and negatives aspects of supervision styles have been found, in order to guide and improve the supervision style some studies indicate that many institutions in Higher Education have developed training in supervision where a PhD student's supervisors must attend a special course. According to (Emilsson & Johnsson, 2007) courses in research supervision for supervisors have been given at more and more universities in Sweden and the government has proposed that 'institutions of higher education with postgraduate programs must offer training in supervision' (Prop. 2000/2001:3), (2004:27, 2004).

According to (Amjad, Asaad, & Rico Cortez, 2020) Supervisors should ensure that they undertake training as part of their continuing professional development to support their work as a supervisor. In addition, supervisors should take the initiative in updating their knowledge and skills by participating in a range of appropriate activities and sharing good practice.

However, the question here is how to find our supervision style? According to (Lee, 2018), many research supervisors feel inadequately prepared for preparing their research students. She argues that a supervisor has responsibility for ensuring that students think about how their research will be but does not mean the supervisors have to become the careers supervisor. Nonetheless, there are generic skills of supervision that can help to be an adequate supervisor.

To find a supervisor style, Lee has created a holistic and integrative framework based on five conceptual approaches: The functional, the enculturation, the critical thinking, the emancipatory and the relationship approach where:

- *The Functional* approach requires a timetable, clear objectives, and regular meetings.
- *The enculturation* approach is focus on encouraging the research student to become a member of a research community, to understand and apply the methods of good practice in the discipline and technical skills.
- *The critical thinking* approach concentrates on the research enquiry and how it contributes original knowledge.
- *The emancipatory* approach concentrates on the personal growth and journey of the research student and the
- *The Relationship* approach focuses on creating an emotionally intelligent relationship between supervisor(s) and student(s).

These different approaches are complementary, and the boundaries between them are permeable. They form a useful basis for disaggregating different beliefs and actions in the supervisory processes.

Methodology

There are three sources of data to be consider, a small-scale study with non-participant observation, the transcripts from two supervision sessions, a short interview and a survey instrument (based on Lee' study), which was send after the supervision sessions to supervisors and PhD students, the results from surveys are compared with observations.

The Small-Scale Study

The study consists of observing two supervision sessions between a supervisor and a PhD student. Each session was carried out in different schools to make a "neutral analysis". Likewise, the observers did not speak or give an opinion of any kind. Neutral is as a self-evident norm in the social sciences. Based on (Malgorzata, Magnus, & Katarzyna, 2018) direct non-participant observation method was conducted through the next steps: The Focus, the Field, the Access, Participants/ Observers, the Criteria and Notes taking.

The Focus

In order to have a clear purpose for carrying out an observational investigation, the main points to observe were first: Identify the supervisory style, using keywords, based on the Five approaches of Lee´s framework: Functional, Enculturation, Critical thinking, Emancipatory and Relationship, and after that identify what are the

challenges and rewards that the supervisor has in a multidisciplinary environment base on a short interview.

The Field

This point is referred to physical place and the area where is the observation research. The first session was in the School of Engineering (JTH) in the department of Product Development, Production and Design (PPD). The second session was in the International Business School (JIBS) in the department of Business Administration (BA).

The Access

To get permission from participants, the observers talked with the main supervisor from their respective areas and managed the appointments, then the observers let them know that they will be observed, what the purpose of the observation was, and how their information will be used.
The first session was in the School of Engineering (JTH), on November 1st, 2022, from 15:30 to 17:00 (90min). The second session was in the School of Business (JIBS), November 16th, 2022, from 8:30 to 10:00 (90min).

The Criteria

The observations were focus on the supervision style based on five approaches of Lee's framework (Lee, 2012). The behavior from supervisors and the PhD students, how they were present and connected with the situation were observed. The observations were objective and unbiased. It was keeping detailed notes of what is observed and avoiding any personal interpretation of the data. The participants should not be aware of the observers, in order to avoid any potential bias in their behavior.

Participants

In this small-scale study were two Professors, three Assistant professors and two PhD students from two different schools. Two Assistant professors participated in two supervision sessions as observers. Table 1 shows the position, the role, the code, the field, and the school of participants. One Assistant Professor works in the Business Administration (BA) department from JIBS, and the other Assistant Professor works in the Product Development, Production and Design (PPD) department from JTH. The main supervisors are Professor in Product Development, Production and Design and Professor in Business Administration. One Assistant professor participated as co-supervisor and works in PPD department. The PhD students were from JTH and JIBS respectively.

Notes Taking During Two Sessions.

During the sessions was gotten permission from participants to record the sessions, and notes were taken.

The survey

The instrument survey was taken from Lee's study (Lee, 2012) which consist in a questionnaire of 20 questions (see appendix section). There were two different surveys, one to supervisors and one for PhD students. There were sent to 4 supervisors and 4 doctoral students.

Table 1. Participants

Position	Role	Code	Field	School
Professor	Main Supervisor	MS	PPD	JTH
Professor	Main Supervisor	MS	BA	JIBS
Assistant Professor	Co-Supervisor	CS	PPD	JTH
Assistant Professor	Observer	O	BA	JIBS
Assistant Professor	Observer	O	PPD	JTH
Doctoral Student		DS	PPD	JTH
Doctoral Student		DS	BA	JIBS

Analysis and Results

This section shows the analysis from observations of the first and second sessions. It's explored how the observations are related to supervision style in a multidisciplinary environment based on Lee's framework.

The Small-Scale Study, Non-Participant Observation
First Session

The goal of the first supervision session was to discuss about the feedback that the PhD student received during his Final Seminar which was carried out on October 16th. The Main Supervisor (MS) started with the management of time, deadlines for applications and the coordination of opponent and committee participants for the next events. The first challenge detected was to have the ability to join people at the same time from different places (in a different country in this case), after that, they began to review the thesis progress that the student had previously submitted.

The co-supervisor focused on the structure of the thesis and mentioned relevant points such as its scope and contributions and the MS suggested how to structure the framework and the connections between published papers, provided highlight to present the results and the contribution with relevant questions. Since the PhD Student (DS) is in the last stage of his doctorate, they discussed how to structure the thesis with all the papers, contributions, and results. The MS suggests feedback on how to conduct the thesis but gives freedom to decide.

Second Session

The session started with a short presentation, the DS is in the beginning of his PhD, so they have had few meetings. The MS mentioned that they never work together before. During the second session the literature review and searching for the research topic was discussed. The DS showed his search of different publications, according to his interpretations how they are connected. Different opinions were discussed from different perspectives at the end, they found a starting point. MS provide relevant advice, suggested theories, methods, and strategies.

The MS visualized what kind of courses the student needs. Another observation was from the perspective on MS, she saw the potential of novelty of the research and mentioned the name of two colleagues who are the experts on topics related with the research, as an observation, the MS visualize the team group and the next courses that the student needs. The plan of courses and suggested time were mentioned.

Finding the Supervision Style

After the sessions, the transcripts from recording were analyzed and summarized. It was identified relevant keywords, as Feedback, Management, Reflection, emotional intelligence, and organization, then they were related to the five approaches of Lee's framework.

Functional

Related to observations and the functional approach, both MS showed good organization, in the first session, meetings are organized, when is necessary, while in the second session, meetings are planned every week, in this case, is needed because is the beginning of the research. Management of time and people are clear in both sessions.

Enculturation

It is an approach related to the discipline, the group, for international students, the enculturation in a national culture. During the observations, both sessions had international students and seven published papers by one student demonstrated discipline, good knowledge of internal and external regulations, and adaptation to the country.

On the other hand, the planning of meetings, the focus on the academic needs of the students for the next five years and the search for people with specific knowledge showed as a kind of welcome to the team. Multidisciplinary aspects were also shown, in both sessions there has been participation in multidisciplinary environments. In the first session, the DS is working with companies.

Critical thinking

It is an approach related to the values of philosophical rigor, and the force and validity of the arguments. Both sessions showed a high level of expertise, the first focused on writing a report, the structure and how to highlight results and contributions. In the second session, the discussion was a guide to find the scope and gaps.

Emancipation

This approach focuses on the journey through the doctoral process, the process of changing a student's worldview, and seeing supervisory work at the doctoral level. The personal growth was very clear when one student is in the beginning process and the other is in the last step. While one seeks a scope the other is adding their contributions. Different things happen during the process, the evolution of knowledge, maturity, and adaptation.

Relationship

Emotional intelligence is a valuable skill, being an expert in a field with the help of emotional intelligence to guide people. Creating an environment of respect, value and belonging to the team is necessary to motivate students, however, there must be a good balance between the professional and the friendly zone. As shown in the first session, the environment was focused on work but considered important aspects, it was observed when the MS asked about the parents' time, this shows respect and consideration. Another observation was shown when the MS and the CS suggested ideas but left the student free to make his decision. It happened in the same environment during the second session, the MS made suggestions but let the student find his topic with support.

As a summary, Table 2 shows in the first column the role of the participants, at the top are the five approaches and the relationship between the keywords related to the participants.

Table 2. Relationship between the Keywords from observations and the five Lee´s approaches.

Role	Functional	Enculturation	Critical Thinking	Emancipation	Relationship
Main Supervisor (MS)	Review thesis progress, Provide feedback. Management/Time	Project management. Create team/ review committee and opponent	Evaluation, questioning about contribution and results	Mentoring Supporting constructivism Reflection	Developing a relationship/team Emotional intelligence
Co-supervisor (CS)	Review thesis progress	Diagnosis of deficiencies, weakness	Structure of report, provide	Supporting constructivism Reflection	Emotional intelligence Developing

			feedback with relevant points		relationship
Doctoral student (Ds)	Present advances from the last seminar Organized Listened feedback	apprenticeship	Constant Working hard. Wrote seven papers	Personal growth	Emotional intelligence, Good team Good relationship with supervisors

The Supervisions Challenges and Rewards

The Challenges

After sessions the observers asked to supervisors what are the challenges and rewards of supervision? And the answers are classified based on the five approaches.

Functional

The main challenges related to time management.

… there is the fuzzy beginning where the student doesn't know what to do or is expected. As it is part of the initial work to set the scope, I cannot give the answer (as I don't have it). This can cause some frustration.

…. Individualized. No distance. To know and understand the student and adjust the level of supervision to him/her. I am also adjusting my supervision to the moment in the process.

I am transitioning from a laissez-faire (leave alone) approach to a more superstructure one, with clear deliverables and continuous meetings.

Enculturation

The technical skills. The ability to manage a situation.

…writing of publication that can be difficult in the beginning and especially of the student cannot produce any text (and I cannot write for them). Then extra efforts are required to break I down in small pieces and have regular meetings.

Emancipation

The project direction.

Another challenge is when the PhD student is not involved in any research project. Then they need to carry out all empirical work on their own which is not so easy, especially not in the initial phases, and it might not be so inspiring to be all alone for 4-5 years.

Critical Thinking

This approach values philosophical rigour, the strength and validity of the argument which needs to be tested in as many ways as possible. A specific situation that is challenging is when a journal article is rejected after 1-2 years of reviewing and revising. Even if I as a supervisor consider the work as acceptable it is not my decision in the end. To get a rejection after a more than a year is critical for the whole process, and it also shows that the scientific peer review process and assessment of scientific work is not predictable. It can also affect the confidence on me as a supervisor.

Relationship

…Another challenge is when a student's confidence is low, and you need to balance official role as a supervisor and the role as colleague/mentor. You know that academia can be a tough environment, and, in the end, you need to fulfill the different requirements within a given timeframe to complete the studies and earn your PhD degree.

…When I dislike the student personally. It is annoying. I try to ignore the personal side in those cases, but it is not fun.

The Rewards

…The reward is when the students submit their first paper, when a paper is accepted, when they show knowledge and confidence in discussions of their work, when the acknowledge what you have done to support them, to see them happy, to see that the creates their own network and becomes "independent", to share the happiness when they have finally earned their PhD exam. These are some examples of rewards during the whole journey.

… The accomplishment against all odds! Finding out how to address the main challenge in the student. The moment of breaking through.

Survey Results

There were two different surveys, one to supervisors and one for PhD students. The Score is done (see the appendix) and is showed in this section. Figure 1 shows the results of survey sent to four supervisors from engineering and business field by email. One of the most highly rated approaches to supervising research in academic supervisor were the *Relationship* approach with 19 of 20 points and the less points were *Functional* and *Enculturation* with 17 of 20 points.

Figure 2 shows the results of survey sent to four PhD students from engineering and business field by email.

The most highly rated approaches to supervising research was the *Critical thinking* approach with 20 of 20 points responses and the less points were *Functional* with 16 of 20 points.
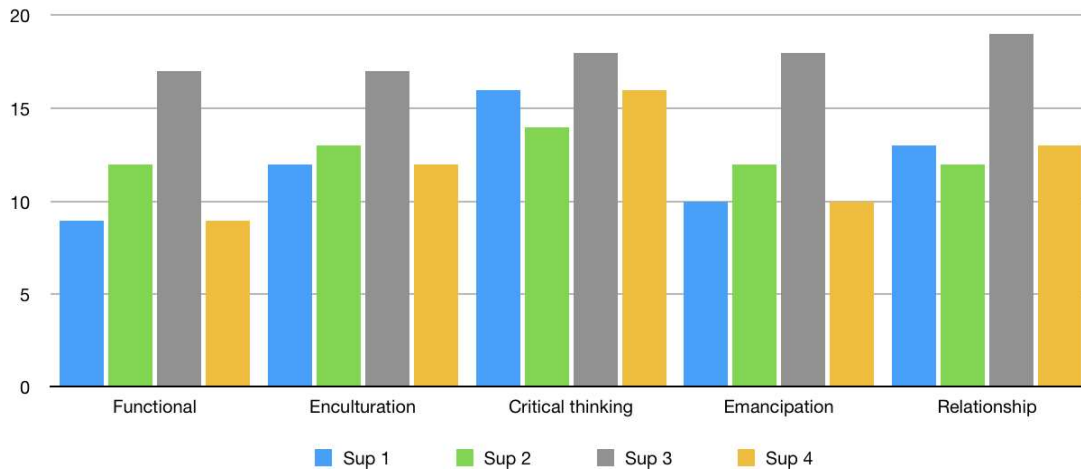

Figure 1. Results of the Supervisors survey
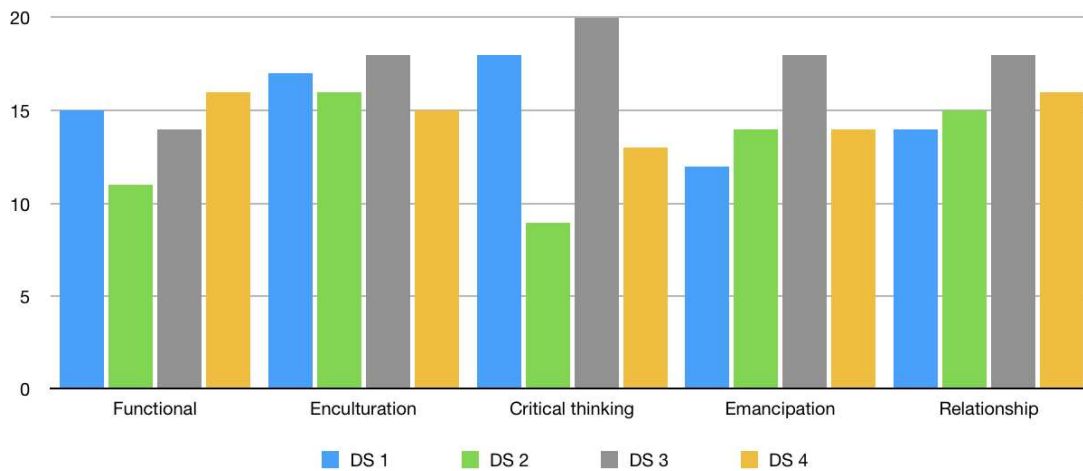
Figure 2. Results of the PhD Students survey

Table 3 shows a comparison between the results of directors and doctoral students. Supervisors focus more on the *Relationship* approach and PhD students on *Critical thinking*.

Table 3. Results from surveys

	Supervisors	**Students**
Functional	17	16
Enculturation	17	18
Critical thinking	18	**20**
Emantipation	18	18
Relationship	**19**	18

Discussion and Conclusions

Which approach do the supervisors think are the most important in supervision research? In one study, one of the highest rated approaches to supervise research in the academic supervisor was the *Functional* approach with 66% responses from supervisors and the second was *Critical thinking* with 61% (Lee, 2018). However, compared to the survey results, the *Relationship* approach was the highest ranked approach, and the second approach were the *Functional* and *Enculturation* approach with 17 points respectively.

Many factors are involved during PhD studies and postgraduate supervision, the main challenges related to time management, the *Functional* approach, it is during the initial work to establish the scope, this takes time and affects the entire process plan, the research project and team, in the case of a multidisciplinary project, could affect the time of others. However, the *Relationship* approach is also important, building a good relationship between the team (academia, companies, government, etc.) helps the process flow and gives time to complete the studies and obtain the PhD.

Which approach do the PhD students think is the most important in doctoral research? According to the results of the survey, the best rated approach was *Critical Thinking,* which assesses the strength and validity of the arguments. At the beginning of the doctoral studies, the exploration of the research topic and the contribution of solid arguments are important when the students present their progress, during the observations it was verified that finding the scope and gaps in the initial stage generates confidence in the students, At the same time, writing a report with good structure and strong arguments builds a strong foundation for article writing and confidence for both the PhD student and the supervisor.

These are some challenges that supervisors and PhD students may have during the doctoral studies, however, finding our style and knowing the style of our students is a good tool to guide us on how to supervise. There are no rules on how to "be" a good or successful supervisor, but tools like the five approaches, presented in this document, can be used to guide us, and help our students. This study has been a small-scale study, and more experiments are needed, however it could provide insights to identify our style. Finding our supervisory style helps to improve our abilities to supervise and help our students, participating in courses to improve our skills helps to update our knowledge and adapt to trends. Modern PhD students, modern supervisors must adapt to new trends, intercultural and multidisciplinary projects. We are living in an era of rapid changes, where the knowledge getting obsolete fast. Internationalization has challenges and rewards; the diversity of cultures and different perspectives could provide innovation during research.

Recommendations

Integrating a good team based on the supervisory style and knowing the type of PhD students could provide a better understanding to guide the students to do good research. Having clear guidelines and creating the

environment for good communication are good starting tools. Through this small study the authors have discovered their own style giving ideas of priorities as a supervisor. Discovering our own style first, our self-recognition process, is a good start to get to know others and create a better team and environment.

Acknowledgements

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Appendix

Supervisor version

Questionnaire to enable a deeper understanding of different conceptual approaches to teaching and supervising postgraduate students:					
Place one tick in a box on each line to indicate the level of importance you attach to that item.	Unimportant		Important		
ID	Question	1	2	3	4	5
1	I always allocate time well ahead for preparation, teaching and marking work for my postgraduate students					
2	My postgraduate students learn how to replicate the practices, procedures, and ethical principles important to this discipline					
3	I want my postgraduate students to think critically, always to recognize flaws in articles, arguments or work that they see					
4	It is important that my postgraduate students understand what motivates them and they examine why they are doing this research					
5	My postgraduate students can manage their own and others' emotions appropriately					
6	I consciously plan my teaching and supervision sessions so that my students will reach the appropriate level					
7	I feel disappointed if good postgraduate students do not want to continue studying or working in the discipline					
8	I want my postgraduate students to demonstrate an independence of mind					
9	My postgraduate students are frequently transformed personally by the work they are doing					
10	I enjoy meetings with my postgraduate students					
11	A research student has to send me something they have written, to demonstrate they are making progress, before I will meet with them					
12	It is important that my students understand the work of key researchers in my field					
13	It is important to me that students can put forward counterarguments					
14	My students often go through a 'dark night of the soul' while doing their research, but emerge stronger for it					
15	It is important that my students maintain positive working					

	relationships with colleagues and help them as required					
16	I note in my diary key dates for tutorials, annual reports etc. so I can monitor progress					
17	I frequently show examples of interesting and excellent work in my field to my postgraduate students					
18	Successful postgraduate students are able to validate or evaluate their arguments in abroad or interdisciplinary way					
19	My postgraduate students learn to reframe the important questions					
20	My postgraduate students enthuse others with their interest in their work					

Student version

Questionnaire to enable a deeper understanding of different conceptual approaches to learning postgraduate students:					
Place one tick in a box on each line to indicate the level of importance you attach to that item.	Unimportant		Important		
	1	2	3	4	5
1	I always like to have a date arranged for the next meeting before I leave the current session				
2	I want to understand and be able to replicate the practices, procedures and ethical principles important to my discipline				
3	It is important to be able to think critically, always to recognise flaws in articles, arguments or work that I see				
4	It is important that I understand what motivates me and I examine why I am doing this research				
5	I think I manage my own and others' emotions appropriately				
6	I keep copies of records of each meeting with my supervisor				
7	I want to continue working in this discipline when I have finished my studies				
8	I want to demonstrate an independence of mind				
9	I expect to become a different person, to be changed or transformed by the research work I am doing				
10	I enjoy meetings with my research supervisor				
11	I like to send my supervisor something to read before I meet with them, to demonstrate I am making progress				
12	It is important that I understand the work of key researchers in my field				
13	It is important that I am able to put forward counter-arguments to propositions				
14	I may go through periods of self-doubt, a 'dark night of the soul' while doing my research, but I will emerge the stronger for it				
15	It is important that I maintain positive working relationships with other departmental staff and help them Integrating				
16	I note in my diary key dates for annual reports etc. so I can monitor my progress				

17	I look for examples of interesting and excellent work in my field to emulate					
18	I believe that successful researchers are able to think in a broad or interdisciplinary way					
19	I think it is important to learn to reframe the important questions					
20	I can enthuse others by my interest in my work					

Scoring your profile

Add the scores up for the following numbers, and it will give you some idea of your priorities as a supervisor.

Q. no.	Score	Q. no.	Score	Q. no.	Score	Q. no.	Score	Q. no.	Score
1		2		3		4		5	
6		7		8		9		10	
11		12		13		14		15	
16		17		18		19		20	
Total functional score		**Total enculturation score**		**Total critical thinking score**		**Total emancipation score**		**Total relationship score**	

Adapted after Shalfawi (2016) and from Lee (2008b)